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ABSTRACT

To integrate many of the theoretical linguistic studies examining pronoun reference, this paper focuses on tracing the shift from purely transformational syntactic studies of intrasentential phenomena to the wider orientations of discourse and pragmatic studies. The first section describes the classic studies of pronominalization within the generative-transformational paradigm, explaining how Noam Chomsky's original model has been modified by other linguists. The second section is further divided into two parts: (1) discourse phenomena and (2) semantic/pragmatic phenomena. The first subsection reflects how the movement of linguistics toward more theoretical studies involving text structure has been manifested in studies on the discourse aspects of pronominalization. The second subsection covers work on pronominalization within the framework of semantics and pragmatics. The final section summarizes the literature review and comments on current theories of pronouns. (JL)

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LINGUISTIC STUDIES ON ENGLISH PRONOMINALIZATION: SYNTACTIC, DISCOURSE AND PRAGMATIC PHENOMENA[1]

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1. Many of the example sentences and/or structures are those of the original authors discussed in this paper. An earlier version of this manuscript was part of a doctoral dissertation by this author (Barnitz 1978).

0.0. Introduction

During the past two decades, linguists have described and explained complex syntactic, semantic and pragmatic phenomena of anaphora, with syntactic pronominalization rules receiving much emphasis. The purpose of this paper is to integrate many of the theoretical linguistic studies examining pronoun reference. In this paper, particular focus is placed on tracing the shift from purely transformational syntactic studies of intrasentential phenomena to the wider orientations of discourse and pragmatic studies.

While anaphora has also received much attention in the fields of psychology and reading education, space does not permit a review of the many developmental and experimental psycholinguistic studies. (See Barnitz 1978 and Webber 1980 for extensive interdisciplinary reviews.) Rather, the following discussion integrates many of the linguistic studies of the past twenty years in order to illustrate how discourse and pragmatic variables have been shown to be crucial to understanding anaphoric syntax. The first section discusses selected intrasentential syntactic phenomena. The second section integrates studies of phenomena beyond the sentence: discourse and pragmatic variables.

1.0. Intrasentential Syntactic Phenomena

The classic studies within the generative - transformational paradigm (Chomsky 1965) viewed pronominalization as a rule of English whereby repeated coreferential noun phrases can appear in surface structure as pronouns. Within the standard model of generative theory, pronominalization was shown to be subject to complex syntactic constraints, which were discussed independently by Langacker (1969) and Ross (1969). These constraints were based on two primacy relations: <u>precedence</u> and <u>command</u> (Langacker 1969). It is often expected that pronouns follow their antecedents (FORWARD pronominalization), while in many cases the reverse is not permissible:

(1) a. Rachel likes Peter and hugged him.

b. *Rachel likes him and hugged Peter. (Note: * = ungrammatical)

(2) a. The professor who wrote these articles must have worked while he was sleeping.

b. *He must have worked while the professor who wrote these articles was sleeping.

However, a theory of grammar with only the constraint of precedence will make improper predictions about English; for there are cases where pronouns may precede their antecedent in surface structures (BACKWARD pronominalization):

(3) Although she went to Palm Beach, Myra did not see any palm trees.

(4) The girl who is to accompany him will visit Phil tomorrow.

Thus, in many cases pronominalization can go forwards as well as backwards. The relevant structure of the sentences is the depth of the pronoun and antecedent in the tree. Consider the following sentences.

(5) a. The student is much more intelligent than he looks.

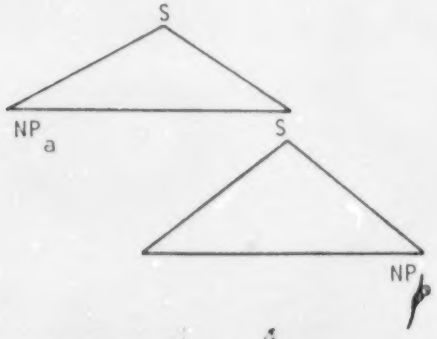
b. *He is much more intelligent than the student looks.

(6) a. The girl who likes him thinks that the animal that bit Gary is a mink.

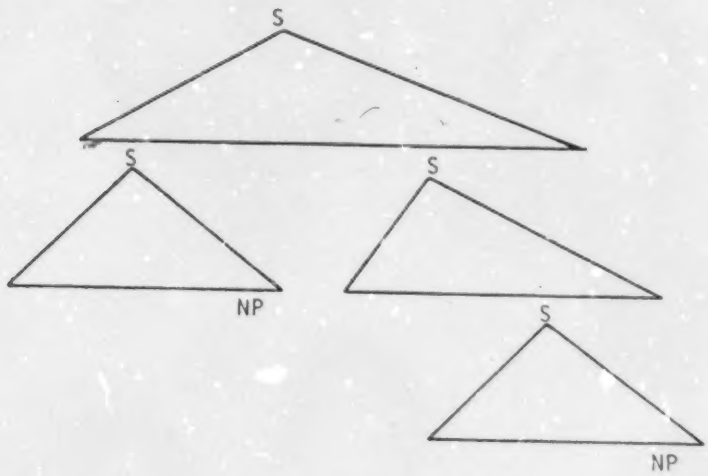
b. The girl who likes Gary thinks that the animal that bit him was a mink.

The depth of structure (5) and (6) are represented in (7) and (8), respectively.

(7)



(8)



In (7) the first S - node dominating NP_a also dominates NP_p; but, the first S - node dominating NP_p does not dominate NP_a. In (8), the first S-node dominating any of the particular NP's do not dominate the other NP. These factors have an effect on constraining pronominalization in terms of the concept command, which is defined as follows by Langacker (1969):

A commands B if

(1) neither A nor B dominates the other:

(2) the S - node that most directly dominates A also dominates B.

The constraint on pronominalization is thus formulated:

NP_a may pronominalize NP_p unless

(1) NP_p precedes NP_a and

(2) NP_p commands NP_a.

Thus, pronominalization will go only one way, if one NP has both primacy relations over the other; but if one NP precedes the other and the other commands the preceding NP, then pronominalization can go backwards as well as forwards.

The preceding analysis by Langacker (1969) has been considered one of the classic generative studies on pronominalization, especially for its explicitness of analysis.

The command theory implies that forward pronominalization may occur unrestrictedly. However, Lakoff (1968a) has demonstrated that in some cases, forward pronominalization is further constrained; and, also that pronominalization may go backwards into main clauses if the noun in the main clause is not a subject. The first point is supported by:

(9) a. *In John's apartment, where Mary practices, he gives her songs to sing.

b. * In John's apartment, he reads poetry.

(10) a. In his apartment, where Mary practices, John gives her songs to sing.

b. In his apartment, John reads poetry.

Forward pronominalization is not permitted when the antecedent is in a preposed adverbial with no adverbial clause. Likewise, backwards pronominalization correctly occurs where the Langacker/Ross hypothesis would prevent it. Backwards pronominalization may go backwards out of subordinate clauses to nonsubjects of main clauses (subject/non-subject condition, Lakoff, 1963a).

(11) a. Mary hit John, before he had a chance to get up.

b. Mary hit him, before John had a chance to get up.

(12) a. Mary gave Sam a dollar bill, before he had a chance to refuse.

b. Mary gave him a dollar bill, before Sam had a chance to refuse.

Another modification of the Langacker/Ross hypothesis has been demonstrated by Ross (1973). Within the theory of "fuzzy grammar" (Ross, 1972; Lakoff, 1973), which tries to account for degrees of grammaticality, Ross has shown some sets of sentences involving pronominalization to be subject to degrees of commandedness:

(13) a. *Ed's pony he realizes that Mary dotes on.

B. ?*Your love for Ed he realizes that Mary never talks about.

c. ??The photographing of Ed he didn't resent.

d. ?Our razzing Ed he didn't resent.

e. ?Us razzing Ed, he didn't resent.

f. Why they didn't invite Ed over he never learned.

g. For us to tickle Ed with a feather he would really love.

This phenomena is captured by the command hierarchy of (14), based on the amount of "sentenciness" a clause may have:

(14) that S (1.0S) > for to (0.95S) > Q (.86S) > Acc. Ing (0.66S) > poss - ing (0.43S) >

action nominal (0.15S) > Derived nom. (0.02S) > noun (0.0S)

There have been several further restrictions on pronominalization. Postal (1971, 1972) has shown that there are crossing restrictions on co-referential forms. Thus, if an interrogative pronoun followed a pronoun or coreferential noun in deep structure, no transformation in a derivation can change the order. Thus, sentences in (15) are not grammatical:

(15) a. *The child Mary said his mother yelled at, was crying.

b. *The car, which, the fact that it got rusty proved was no good, is outside.

Cole (1974) has pointed out that there is a constraint against backward pronominalization with indefinite antecedents:

(16) a. Every lion will attack when it is cornered.

b. *When it is cornered, every lion will attack.

(17) a. Each boy answers when he is called on.

b. *When he is called on, each boy answers.

(18) a. Who was searched when he crossed the border?

b. *When he crossed the border, who was searched?

Another issue of pronominalization syntax is that of how much structural identity the two coreferential noun phrases must have before pronominalization must apply. In an interpretive theory (Jackendoff, 1968), coreference is treated as a semantic function marked by features in the deep structure, not via transformations. Coreference is therefore marked. In traditional generative studies (Chomsky 1957; Lees & Klima, 1969), the two noun phrases must be identical in structure before pronominalization applies. The controversy was further complicated by sentences discovered by Emmon Bach and Stanley Peters and discussed in Kartunnen (1971):

(19) The pilot who shot at it hit the Mig which chased him.

Complete structural identity isn't possible; otherwise there would have to be infinite deep structures. Furthermore, it is true that pronouns not only refer to nouns, but often to full propositions. Examples of "sentence pronominalization" are listed in (20) (Lakoff, 1970).

(20) a. Although Sid asserted that Max left, I didn't believe it.

b. Although Sid asserted it, I didn't believe that Max left.

c. I didn't believe that Max left, although Sid asserted it.

d. *I didn't believe it, although Sid asserted that Max left.

The previous discussion outlined some of the major findings about pronominal syntax within the generative-transformational framework. More recent research examined phenomena beyond the sentence boundaries.

2.0 Phenomena Beyond the Sentence

The research on pronominalization syntax, without reference to discourse and pragmatic variables, did not capture many of the factors governing the use of anaphora (See Stenning 1978.) For purposes of discussion, the following section is divided into two parts: discourse phenomena and semantic/pragmatic phenomena. However, in reality, pragmatic and discourse variables

interact with each other in pronominal performance.

2.1. Discourse Phenomena

Linguistics has moved toward more theoretical studies involving text structure (See Morgan & Sellner 1980). Halliday and Hasan (1976, pp. 1-2) defined text as "any passage, spoken or written, of whatever length, that does form a unified whole." They described text as a semantic unit which has a structural realization. Anaphoric reference is just one aspect of text cohesion which "occurs when the INTERPRETATION of some element in the discourse is dependent on that of another." Anaphoric reference, then, interrelates information in a discourse.

Linguistic studies on discourse aspects of pronominalization were conducted by Kuno (1972, 1975), who has done a broad analysis of pronominalization within the tradition of functional analysis of discourse. A functional approach to syntax involves the following discourse concepts: old predictable information, new unpredictable information, theme, and exhaustive listing. Old predictable information refers to information previously mentioned in the discourse, while new unpredictable information is the opposite. Theme refers to what "the rest of a sentence may be about." Following information may refer to it; therefore, theme may be discourse anaphoric. Kuno (1975, p. 278) defines exhaustive listing interpretation as a feature of a noun phrase that is used "when the speaker asserts that the rest of the sentence is true only with respect to the referent of the noun phrase, and is false with all other members of the class that is under discussion. Consider the discourse in (21) (Kuno 1975):

(21) a. SPEAKER A: Among John, Bill, and Tom, who teaches high school?

b. SPEAKER B: John does.

Thus, speaker B is asserting that only John, excluding the others, teaches high school.

The sentence perspective functions play a role in pronominalization. Backward pronominalization according to Kuno is permissible only when the referent of the pronoun is predictable from the preceding discourse as in (22) and (23):

(22) a. SPEAKER A: Who is visiting John?

b. SPEAKER B: His brother is visiting John.

(23) a. SPEAKER A: Who is visiting who?

b. SPEAKER B: His brother is visiting John.

Another constraint uses the sentence perspective concept of theme: The predictable theme of a sentence cannot be pronominalized intrasententially.

(24) a. SPEAKER A: What will John do this Sunday?

b. SPEAKER B: *If John can, he will go to see a movie.

c. but: If he can, John will go to see a movie.

(25) a. SPEAKER A: Who will do this for me?

b. SPEAKER B: If John can do it, he will do it for you.

A constraint involving exhaustive listing interpretation is that noun phrases of exhaustive listing interpretation cannot be pronominalized intra- sententially.

(26) a. Among Mary, John, Jane and Martha, John is the tallest.

b. ??Among Mary, John, Jane and Martha, he is the tallest.

(27) a. SPEAKER A: Who killed Mary?

b. *SPEAKER B: * With an accomplice that John hired, he killed Mary.

Kuno (1975, p. 280) outlines his theory of pronominalization, which applies after all movement transformations in a derivation:

I. Across-the-Board Discourse Pronominalization

"Pronominalize all occurrences of noun phrases in a given sentence whose referents are clear from the preceding discourse."

II. Partial Discourse Pronominalization:

"If a given noun phrase in a sentence has a discourse anaphora, pronominalize all but one of the occurrences of the noun phrases in the sentence."

Constraints

A. The Command-Precedent Constraint

"Do not pronominalize the noun phrase that both precedes and commands the coreferential noun phrase in the sentence."

B. The Constraint on Predictable Theme Pronominalization

"Do not pronominalize the predictable theme of the sentence."

(28) What did John do for Mary?

a. When he went to Boston, John took her out to dinner.

b. *When John went to Boston, he took her out to dinner.

(29) Who did what for Mary?

a. *When he went to Boston, John took her out to dinner.

b. When John went to Boston, he took her out to dinner.

C. The Constraint on Focus Pronominalization

"Do not pronominalize the noun phrase of exhaustive listing interpretation unless it is coreferential with the discourse topic."

(30) *Between John and Jane, he is the brighter.

(31) a. SPEAKER A: Who do you like better, John or Mary?

SPEAKER B: *I like him better.

SPEAKER C: I like John better.

D. The Predictability Requirement on Backward Pronominalization

"Do not pronominalize the left hand noun phrase unless its referent is determinable (predictable) from the preceding context."

(32) a. SPEAKER A: What did you do when you saw Harry mad?

b. SPEAKER B: (?) I calmed him before Harry did something rash.

(33) a. SPEAKER A: Who did you calm when you saw him getting mad?

b. SPEAKER B: *I calmed him before Harry did something rash.

E. The Imitation Tendency

"If backward pronominalization is to apply, leave unpronominalized the noun phrase in the 'known part' of the sentence."

(34) a. SPEAKER A: What did you do about Harry?

b. SPEAKER B: *I calmed him before Harry did something rash.

(35) a. SPEAKER A: Who calmed Harry?

b. SPEAKER B: *I calmed him before Harry did something rash.

(Compare (34) and (35) with (32) and (33). When the unpronominalized form is in parallel structure with the referent in the question, the sentence is more acceptable.)

III. Intra-Sentential Pronominalization

"If Discourse Pronominalization is not acceptable, apply Intra-sentential Pronominalization, which works only from left to right."

Constraints

A. The Constraint on Focus Pronominalization

"Do not pronominalize the noun phrase of exhaustive listing interpretation." (See sentences in (26) and (27).

B. The Constraint on Pronominalization with Genitive Antecedent

"Do not pronominalize with a genative noun phrase as antecedent."

(36) a. John and his sister went to Paris.

b. *John's sister and he went to Paris.

This constraint is related to the concept of empathy, which is: "Give syntactic prominence to the person who you are describing -- who you are empathizing with." (c.f. Kuno & Kaburaki 1977.)

The preliminary study of pronominalization in discourse by Kuno illustrates how many discourse factors influence the use of pronouns, Kantor (1977) has examined other factors influencing the management of pronominals

in discourse. Kantor particularly demonstrated that the expectation of reference to a noun or noun phrase is a crucial consideration in the use and comprehension of pronoun reference. Consider the discourse (37).

(37) A good share of the amazing revival of commerce must be credited to the ease and security of communications within the empire. The Imperial fleet kept the Mediterranean Sea cleared of pirates. In each province the Roman emperor repaired or constructed a number of skillfully designed roads. They were built originally for the army but served the merchant class as well. Over them messengers of the imperial service, equipped with relays of horses, could average fifty miles a day.

In this discourse the pronoun they in the sentence they were built refers to roads, but the reader may need to reread the passage because he may expect the sentences after skillfully designed roads to be about some fact dealing with easing or securing communication within the empire. A remedy for this passage is illustrated in discourse (38).

(38) A good share of the amazing revival of commerce must be credited to the ease and security of communications within the empire. The Imperial fleet kept the Mediterranean Sea cleared of pirates. In each province the Roman emperor repaired or constructed a number of skillfully designed roads. These (roads) were built originally for the army but served the merchant class as well. Over them, . . .

These examples illustrate the effect of expectation and consciousness on pronoun use and comprehension.

2.2. Semantic and Pragmatic Variables

Early work on pronominal semantics and pragmatics was conducted by Lakoff (1968b) who demonstrated the problems of incorporating reference in syntactic theory, using the theoretical device of referential indices in the generative rules (Chomsky 1965). Problematic situations and examples discussed by Lakoff (1968b) are outlined below.

1. One person in the actual world is split into two in another possible world.

   (39) I dreamed that I was Brigette Bardot and that I kissed me.

   Here, more than one universe of discourse of possible worlds is being considered: the actual world in which "I" am dreaming, and the world of the dream.

2. Two distinct people in one possible world are collapsed into a single individual in another world.

   (40) You think that Nixon and Humphrey are different people and that they will campaign against each other and one of them will lose, but, I think that Nixon and Humphrey are the same person and that he will win.

3. A referent is in the mind of the speaker, but is not yet existent in the existent situation.

   (41) John wants to catch a fish and he wants to eat it.

   (42) *John wants to catch a fish and he will eat { *it. / the fish he catches. / the fish. }

   (43) John wants to catch a fish and Bill wants to eat { *it. / ?the fish. / the fish John wants to catch. }

In (41) the fish and the it are in the same world, the world of John's desires. In (42) and (43) the fish is in the world of John's desires, but it is in the real world where the fish does not exist.

Now consider (44) and (45).

(44) John wants to catch a fish and he intends to eat it.

(45) *John intends to catch a fish and he wants to eat it { *Ø / if he catches one. / the fish.

Here the fish of John's desires has a counterpart in the world of his intentions, but not vice versa. But note that the non-pronominalized structure seems better. So there appears to be an interaction between pronominalization and the cont rast between the world of desire and the real world. (Lakoff 1968b). Thus, consciousness and knowledge of the world interact with pronominalization.

Studies by Chafe (1970, 1974) further illustrate nonsyntactic variables. Chafe (1970), presenting pronominalization as a special variety of deletion of a lexical unit which is sometimes optional and sometimes obligatory, analyzed pronominalization in terms of new/old information and the consciousness of the hearer. A lexical unit is subject to deletion (pronominalization) if it is not specified as NEW information -- in other words, if the unit is old information. This also holds true for what is considered new in the hearer's memory or consciousness, which often governs intonation, pronominalization, or word order (Chafe, 1974, p. 113). Consider the sentences in (46).

(46) a. I just found some books that belong to Peter.

b. I wish I knew where Peter's living now.

c. I'd like to give these books to him.

If some books is in the consciousness of the hearer, then pronominalization will likely occur with low pitch. If before the discourse above, it is assumed by the speaker that books are already in the consciousness of the hearer, then the result could be sentence (47).

(47) I just found some that belong to Peter.

The consciousness of the hearer is an important factor in a discourse. A conversational principle for the use of pronominalization might be formulated roughly as: A speaker must be sensitive to what is in the hearer's mind. The referent must be in the on-stage discourse, a common experience, or in the situational context (deixis). Furthermore, the speaker may have to reiterate information to keep the thread of thought in the consciousness of the hearer by reiterating the referent to aid memory in long discourses. However, there may be times when the speaker assumes that a hearer might have a different referent in mind, or there may be a potential ambiguity. The speaker may then do one of two things: use contrastive stress on the pronoun as in (48), or just not pronominalize as in (49).

(48) Bill bought a car for her, not Mary.

(49) a. John and Bill went to the party although

{ Bill didn't want to.
(John didn't want to.

b. *John and Bill went to the party although he didn't want to.

Another conversational principle, then, may be stated: Do not pronominalize if an ambiguity may occur. Much more research is needed in this area of pronominal pragmatics.

Additional work on pragmatic aspects of pronominals was presented by Bolinger (1977). Bolinger (1977) has given an extensive analysis of pragmatic factors involved in identifying a referent. Bolinger has argued that the concept of a noun phrase pronominalizing another is misleading. Instead, linguistic theory should try to answer the question: "What reason does the speaker have for identifying the referent at a given point with a fullmess of semantic features?" Furthermore, Bolinger argued against the generative concept of "backwards pronominalization"; for he claimed that pronouns probably relate to a noun phrase previously mentioned in discourse or known by the speaker and hearer. However, Bolinger conceded that there are cases where a pronoun precedes its antecedent in English, but he pointed out that it would be faulty to assume that there is a pronoun to the left <u>because</u> there is a noun phrase to the right. The user of language uses a pronoun first for a variety of independent reasons illustrated by examples:

(50) Hey Gus! Tell him to come in if you see Tom out there, will you?

(51) Hey Gus! If you see him out there tell Tom to come in, will you?

(52) Hey Gus! If you see Tom out there tell him to come in.

In these sentences, the implications are not identical. In (50) and (51), the sentence is just an offhand utterance. But in (52), some consequence for Tom is suggested. Thus, the pronoun to the left has a different effect or meaning than the pronoun to the right.

Another case is the situation where a speaker uses a pronoun in the main clause followed by a coreferent noun in the subordinate clause as in (53) and (54).

(53) *He choked when John swallowd the bone.

(54) When he swallowed the bone, John choked.

It appears that the difference of grammaticality is only syntactic, but there are other explanations. First, with the right prosody, (53) becomes acceptable:

(55) He choked (when John swallowed the bone, that is).

Other examples of this "after thought" construction are:

(56) He lied to me-- something that John was rather fond of doing.

(57) He was quite a guy, if John doesn't mind my saying so.

Another nonsyntactic factor affecting the appearance of a pronoun to the left of its antecedent is found in examples like (58) - (63).

(58) John looks at the wall and he throws the ball at it.

(59) *He looks at the wall and throws the ball at it.

(60) John looks at the wall and throws the ball at it.

(61) John looks at me and he goes out of his mind.

(62) He looks at me and John goes out of his mind.

(63) John looks at me and goes out of his mind.

Consider examples (59) and (61). The predominant feature affecting the appropriateness of the structure is not syntactic, but semantic. If there is a temporal connection between the clauses, the noun may not be repeated to the right of the pronoun.

The importance of the Bolinger paper is that it clearly shows a theoretical shift in empahsis of syntactic features of pronoun-referent structure to an emphasis on pragmatic factors affecting pronoun-reference.

Most recently, Nash-Webber (1978), Webber (1978) and Webber (1980) argued for the role of inference in anaphora. The following sentence illustrates how general world knowledge is needed to comprehend an anaphoric structure.

(64) John found a shop manual for his Fiat, but the page specifying the dwell angle was missing.

To summarize current thinking on pragmatic aspects of many types of anaphora, Nash-Webber (1978) illustrated three sources for antecedents and referents:

1. Linguistically, from the explicit discourse

   (65) Wendy didn't give either boy a tie-dyed T-shirt.
   However, she did give Janet a red one.

2. Perceptually, from the spatio-temporal environment (deixis)

   (66) (Bonnie goes up to a balloon man at the circus and says)
   "Do you have a blue one with green stripes."

3. Inferentially, reasoning from the existence of particular other entities, e.g. knowledge of the world:

   (67) I have a '71 Ch. Figeac, a '76 Fleurie, a '71 Ockfener Bockstein and a '75 Durkheimer Feuerberg in the cellar. Shall we have the German ones for dinner tonight?
   (ones = wine).

   (See Webber (1980) and Stenning (1978) for additional discussions on pragmatic aspects of discourse anaphora.)

3.0. Concluding Commentary

This paper provided a very brief survey of many of the major linguistic studies on pronominalization. The trends in syntax research has shifted from studying autonomous syntactic factors in pronominalization to examining semantic, pragmatic and discourse factors. There have been many serious empirical challenges in doing syntactic research on pronominalization. Variations in grammaticality judgements by different speakers make much of the data confusing. When speakers make judgements about a sentence, they may construct their own context for the sentences, which may be different than the linguist's. Furthermore, there is a difference between oral and

written language; a sentence may be acceptable when written in the journal article, but questionable when read at a linguistics convention. This may result from a natural interaction between syntax of sentences and such factors as intonation, stress, sentence length, context and function. In addition to problems in grammaticality judgements, there are many disagreements in the syntax literature. For example, pronouns were often viewed as surface forms representing underlying nouns in the deep structure (Langacker, 1969; Lees & Klima, 1969; Ross, 1969). This was challenged by Jackendoff (1968, 1972) who claimed that pronouns are generated in the deep structure and interpreted by semantic rules. Lakoff (1968), meanwhile, claimed that pronominalization phenomena are not accounted by transformational rules, but rather by "output conditions" stated at the surface structure level which indicate the relationships pronouns may have with their antecedents. And more recently, Kuno (1972, 1975) has examined pronominal phenomena in the light of discourse structure; while, Bolinger (1977) has argued against the view that a noun phrase causes another noun phrase to become a pronoun by the transformational process of pronominalization. Pronoun phenomena ~~is~~ are now being studied in the light of language use, context, consciousness, and inference. Thus, pragmatic and discourse factors are crucial to an understanding of anaphoric syntax.

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